

Claims

1. Hydraulic system, comprising at least one hydraulic drive means (1), a conduit system (10) connected to the hydraulic drive means for convey hydraulic liquid to and from the hydraulic drive means, where the conduit system comprises a conduit circuit (11) containing hydraulic liquid, connected to the hydraulic drive means, a pump (12) for generating a flow of hydraulic fluid in the conduit system and a motor (13) to power the pump, characterized in that,
- the pump (12) is arranged to control the flow of hydraulic liquid in said circuit (11), and
 - that the hydraulic drive means (1) is controllable substantially only by controlling the flow of hydraulic liquid in said circuit (11) by means of the pump (12).
2. Hydraulic system according to claim 1, characterized in that, the pump (12) is arranged to control the direction of the flow of hydraulic liquid in said circuit (11) and thereby control the direction of action of the hydraulic drive means (1).
3. Hydraulic system according to claim 1 or 2, characterized in that, the pump (12) is arranged to control the flow rate of the hydraulic liquid in said circuit (11) and thereby control the effective rate of the hydraulic drive means (1).
4. Hydraulic system according to any of claims 1-3, characterized in that, the motor (13), that powers the pump (12), is arranged to control the pump to control the flow of hydraulic liquid in said circuit (11).
5. Hydraulic system according to any preceding claims, characterized in that, said motor (13) is an electrically driven motor.
6. Hydraulic system according to any preceding claims, characterized in that, it comprises means for regenerating mechanical

energy transmitted to the hydraulic drive means (1), due to loading of the hydraulic drive means.

5 7. Hydraulic system according to claim 6, characterized in that, said energy regeneration means include the motor (13), that is arranged to be driven as a generator by the pump (12), for re-generation of energy when said mechanical energy transmitted to the hydraulic drive means (1) is transformed to liquid energy of the hydraulic liquid in said circuit (11) and thereby powers the
10 pump (12).

8. Hydraulic system according to claim 6 or 7, characterized in that, it comprises means to store regenerated energy.

15 9. Hydraulic system according to claim 8, characterized in that, said energy storage means comprises at least one rechargeable battery.

20 10. Hydraulic system according to any of claims 6-9, characterized in that, the motor (13) is powered by the energy regenerated by said energy regeneration means.

25 11. Hydraulic system according to claim 10, characterized in that, the motor (13) is powered by regenerated energy stored in said energy storage means.

30 12. Hydraulic system according to any of the preceding claims, characterized in that, the hydraulic drive means (1) is a hydraulic cylinder.

35 13. Hydraulic system according to claim 12, characterized in that, the hydraulic cylinder has chambers (4, 5) containing hydraulic liquid, arranged on opposite sides of a piston (2), with a piston rod (3) connected to the piston received in one chamber (5), and that the system comprises an arrangement (16-22) arranged to provide a supply of hydraulic liquid to said conduit cir-

cuit (11) on controlling the hydraulic cylinder (1) to move the piston in a direction for reducing the volume of said one chamber (5) and to tap hydraulic liquid from the conduit circuit (11) on movement of the piston in the opposite direction.

5

14. Hydraulic system according to claim 13, **characterized** in that, the arrangement comprises at least two conduits connected to a tank (19) for hydraulic liquid and to the conduit circuit (11) via a valve (17, 18) each.

10

15. Hydraulic system according to claim 14, **characterized** in that, a first of the conduits connected to the hydraulic liquid tank has a one-way valve (18) that only makes the flow of hydraulic liquid from the tank (19) to the conduit circuit (11) possible to supply hydraulic liquid to the conduit circuit on movement of the piston in the direction for reducing the volume in said one chamber (5) when the valve (17) is closed in the second conduit (21) to the tank, whereby the second conduit (21) is connected to the conduit circuit (11) nearer to said one chamber (5) than to the first conduit (22).

15

20

16. Hydraulic system according to claim 15, **characterized** in that, the valve (17) in the second conduit (21) is controllable to be open when the piston is displaced in the direction for reducing the volume in said one chamber (5).

25

17. Hydraulic system according to claim 15 or 16, **characterized** in that, the arrangement comprises a third conduit (20) connected, via a valve (16), to the hydraulic liquid tank (19) which is connected to the conduit circuit (11) on the opposite side of the first conduit's (22) connection thereto relative to the second conduit (21), and that the valve (17) in the second conduit (21) is controllable to be closed and the valve (16) in the third conduit (20) is controllable to be open simultaneously when the piston is displaced in the direction for reducing the volume in said one chamber (5).

30

35